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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/724,803	11/28/2000	Gregory G. Cappiello	34013-28PT	7805

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EXAMINER

AMARI, ALESSANDRO V

ART UNIT

PAPER NUMBER

2872

DATE MAILED: 01/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/724,803

Applicant(s)

CAPPIELLO ET AL.

Examiner

Alessandro V. Amari

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 October 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-145 is/are pending in the application.
- 4a) Of the above claim(s) 1-34, 40-45, 65-100, 106-111 and 132-145 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 35-39, 46-64, 101-105 and 112-131 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 November 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3, 8, 15-1. 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group II, species 1 in Paper No. 13 is acknowledged.

Information Disclosure Statement

2. The information disclosure statement filed 16 March 2001 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 35-39, 46-50, 51-55, 56-60, and 61-64 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 37-41, 48-52, 53-57, 58-62 and 63-67 of copending

Application No. 09/724,804. Although the conflicting claims are not identical, they are not patentably distinct from each other because it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the reflection grating of the instant application in the device of the co-pending application since it is well-known to use gratings in spectrometers.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

5. Claims 35-39, 46-50, 51-55, 56-60, and 61-64 are provisionally rejected under 35 U.S.C. 103(a) as being obvious over copending Application No. 09/724,804 which has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the copending application, it would constitute prior art under 35 U.S.C. 102(e) if published or patented. This provisional rejection under 35 U.S.C. 103(a) is based upon a presumption of future publication or patenting of the conflicting application. Although the conflicting claims are not identical, they are not patentably distinct from each other because it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the reflection grating of the instant application in the device of the co-pending application since it is well-known to use gratings in spectrometers.

This provisional rejection might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the copending application was derived from the inventor of this application and is thus not the invention "by another," or by a showing of a date of invention for the instant application prior to the effective U.S.

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filing date of the copending application under 37 CFR 1.131. For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(I)(1) and § 706.02(I)(2).

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 35, 46, 50, 51 and 55 are rejected under 35 U.S.C. 102(b) as being anticipated by Mowry, Jr. et al. U.S. Patent 5,403,040.

In regard to claim 35, Mowry, Jr. et al. discloses a diffraction grating, comprising: a reflective material having a blazed surface with a blaze angle between about 27 degrees and about 39 degrees; and an optically transmissive material disposed adjacent the reflective material and having an index of refraction (n), wherein the blazed surface of the reflective material has approximately $(500 \pm 110) * n$ number of grooves per millimeter as described in column 5, lines 43-48.

In regard to claim 46, Mowry, Jr. et al. discloses a diffraction grating, comprising: a reflective material having a blazed surface with a blaze angle between about 37 degrees and about 40 degrees and an optically transmissive material disposed adjacent the reflective material having an index of refraction (n), wherein the blazed surface of

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the reflective material has approximately $(200 \pm 40) \times n$ number of grooves per millimeter as described in column 5, lines 43-48.

Regarding claim 50, Mowry, Jr. et al. discloses a substantially planar substrate on which the reflective material is formed as shown in Figures 1 and 2.

In regard to claim 51, Mowry, Jr. et al. discloses a diffraction grating, comprising: a reflective material having a blazed surface with a blaze angle between about 41 degrees and about 44 degrees; and an optically transmissive material disposed adjacent the reflective material having an index of refraction (n), wherein the blazed surface of the reflective material has approximately $(450 \pm 40) \times n$ number of grooves per millimeter as described in column 5, lines 43-48.

Regarding claim 55, Mowry, Jr. et al. discloses a substantially planar substrate on which the reflective material is formed as shown in Figures 1 and 2.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 35, 37, 46, 51, 56-58, 60-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laude U.S. Patent 5, 080,465.

In regard to claim 35, Laude teaches (see Figure 13) a diffraction grating, comprising: a reflective material (726) having a blazed surface with a blaze angle between about 27 degrees and about 39 degrees as described in column 4, lines 65-68;

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and an optically transmissive material (air), disposed adjacent the reflective material and having an index of refraction (n) ($n_{\text{air}} = 1.0$), wherein the blazed surface of the reflective material has approximately $(500 \pm 110) * n$ number of grooves per millimeter and column 5, lines 4-5.

Regarding claim 37, Laude teaches that the diffraction order associated with the lowest loss is the first order as described in column 5, lines 8-10.

While the reflective grating does not explicitly cite the blaze angles and groove densities cited, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the blaze angles and groove densities cited in order to maximize the performance of the grating.

In regard to claims 46, 51, 56 and 61, Laude teaches (see Figure 13) the diffraction grating comprising a reflective material (726) having a blazed surface and an optically transmissive material (air), disposed adjacent the reflective material and having an index of refraction (n) ($n_{\text{air}} = 1.0$), but does not teach that the blazed surface has a blaze angle between 37 and 40 degrees and that the blazed surface of the reflective material has approximately $(200 \pm 40) * n$ number of grooves per millimeter or that the blazed surface has a blaze angle between 41 and 44 degrees and that the blazed surface of the reflective material has approximately $(450 \pm 40) * n$ number of grooves per millimeter or that the blazed surface has a blaze angle between 68 and 76 degrees and that the blazed surface of the reflective material has approximately $(200 \pm 20) * n$ number of grooves per millimeter or that the blazed surface has a blaze angle between

50 and 56 degrees and that the blazed surface of the reflective material has approximately $(250 \pm 30) \times n$ number of grooves per millimeter.

Regarding claims 57 and 58, Laude teaches the index of refraction of the optically transmissive material is approximately 1.0 but does not teach that the number of grooves per millimeter for the reflective material is between about 180 and about 220; or (in regard to claim 58) that the diffraction order associated with the lowest loss is the fifth order.

Regarding claim 60, Laude teaches a substantially planar substrate on which the reflective material is formed as shown in Figure 13.

Regarding claims 62 and 63, Laude teaches the index of refraction of the optically transmissive material is approximately 1.0 but does not teach that the number of grooves per millimeter for the reflective material is between about 220 and about 280; or (in regard to claim 63) that the diffraction order associated with the lowest loss is the fourth order.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to arrive at the blaze angles and groove frequencies and diffraction orders with the lowest losses claimed, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. One would have been motivated to vary the blaze angles and groove frequencies for the purpose of achieving different diffraction efficiencies.

10. Claims 59 and 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laude U.S. Patent 5, 080,465 in view of Official Notice.

Regarding claims 59 and 64, Laude teaches the invention as set forth above but does not teach that the reflective material is at least one of the following: gold material, aluminum material and silver material. Official Notice is taken that it is notoriously old and well known in the grating art to utilize reflective material from one of the following: gold material, aluminum material and silver material. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use gold, aluminum or silver in order to provide the reflective property of the grating.

11. Claims 36, 38, 39, 47, 48, 50, 52, 53 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laude U.S. Patent 5, 080,465 in view of Knop U.S. Patent 4,426,130.

Regarding claim 36, Laude teaches the invention as set forth above but does not teach that the number of grooves per millimeter for the reflective material is between about 710 and about 790 or in regard to claim 38, that the number of grooves per millimeter is between about 850 and 950 and that the blaze angle is between 31 and 34 degrees or in regard to claim 39, that the number of grooves is between 950 and 1050 and that the blaze angle is between about 34 and 39 degrees; or in regard to claim 47, that the number of grooves per millimeter is between 260 and 340 or in regard to claim 48 that the diffraction order associated with the lowest loss is the fourth order or in regard to claim 52, that the number of grooves per millimeter is between 560-640 or in regard to claim 53 that the diffraction order associated with the lowest loss is the second

order or that the index of refraction of the optically transmissive material is between about 1.44 and about 1.64.

Regarding claims 50 and 55, Laude teaches a substantially planar substrate on which the reflective material is formed as shown in Figure 13.

Knop does teach that the index of refraction of the optically transmissive material is between about 1.44 and 1.64 as described in column 6, lines 23-62.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the optically transmissive material having an index of refraction between about 1.44 and 1.64 in order to protect the grating.

Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to arrive at the blaze angles and groove frequencies and diffraction orders with the lowest losses claimed, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. One would have been motivated to vary the blaze angles and groove frequencies for the purpose of achieving different diffraction efficiencies.

12. Claims 49, 54, 59 and 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laude U.S. Patent 5, 080,465 in view of Official Notice.

Regarding claims 49, 54, 59 and 64, Laude teaches the invention as set forth above but does not teach that the reflective material is at least one of the following: gold material, aluminum material and silver material. Official Notice is taken that it is notoriously old and well known in the grating art to utilize reflective material from one of

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the following: gold material, aluminum material and silver material. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use gold, aluminum or silver in order to provide the reflective property of the grating.

13. Claims 101, 103, 112, 117, 122, 123, 125-128, 130 and 131 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamel et al. U.S. Patent 5,748,815 in view of Laude U.S. Patent 5,080,465.

In regard to 101, 103, 112, 117, 122, 125-128, 130 and 131, Hamel et al. does teach (see Figure 5) a wavelength division device, comprising: a plurality of first coupling components (72, 74, 76, 78), each first component being capable of receiving a distinct carrier for carrying a signal; a second coupling component (68) disposed adjacent the first coupling components and capable of receiving a distinct carrier for carrying one or more signals; and a diffraction grating (70) optically coupled to each carrier received by the first and second coupling components and a diffraction grating optically coupled to each carrier received by the first and second coupling components as shown in Figure 5.

However, Hamel does not teach the diffraction grating claimed above.

In regard to claims 101 and 103, Laude teaches the invention as applied to claim 35 and 37 above.

In regard to claims 112, Laude teaches the invention as applied to claim 46 above.

In regard to claim 117, Laude teaches the invention as applied to claim 51 above.

In regard to claim 122, 123, 125 and 126, Laude teaches the invention as applied to claims 56, 58, 57, and 60, respectively above.

In regard to claims 127, 128, and 131, Laude teaches the invention as applied to claims 61, 63, and 62 above.

Regarding claim 130, Laude teaches a substantially planar substrate on which the reflective material is formed as shown in Figure 13.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the grating of Laude in the device of Hamel in order to improve the multiplexer performance.

14. Claims 114, 119, 124 and 129 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laude U.S. Patent 5,080,465 in view of Hamel et al. U.S. Patent 5,748,815 and further in view of Official Notice.

Regarding claims 114, 119, 124 and 129, Laude teaches the invention as set forth above but does not teach that the reflective material is at least one of the following: gold material, aluminum material and silver material. Official Notice is taken that it is notoriously old and well known in the grating art to utilize reflective material from one of the following: gold material, aluminum material and silver material. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use gold, aluminum or silver in order to provide the reflective property of the grating.

15. Claims 102, 104, 105, 113, 115, 116, 118, 120, and 121 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamel et al. U.S. Patent 5,748,815 in view of Laude U.S. Patent 5,080,465 and further in view of Knop U.S. Patent 4,426,130.

In regard to claims 102, 104 and 105, Hamel and Laude teach the invention as set forth above and as applied to claims 36, 38 and 39, respectively.

In regard to claims 113, 115 and 116, Hamel and Laude teach the invention as set forth above and as applied to claims 48, 47 and 50, respectively.

In regard to claims 118, 120 and 121, Hamel and Laude teach the invention as set forth above and as applied to claims 53, 52 and 55, respectively.

Knop does teach that the index of refraction of the optically transmissive material is between about 1.44 and 1.64 as described in column 6, lines 23-62.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the optically transmissive material having an index of refraction between about 1.44 and 1.64 in the combination in order to protect the grating and in order to improve the multiplexer performance.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alessandro V. Amari whose telephone number is (703) 306-0533. The examiner can normally be reached on Monday-Friday 8:00 AM to 5:30 PM.

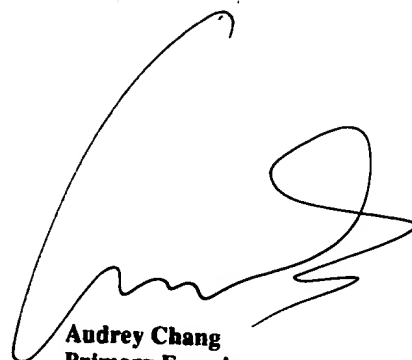
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cassandra Spyrou can be reached on (703) 308-1687. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

ava *ACg*
December 26, 2002



Audrey Chang
Primary Examiner
Technology Center 2800